PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-159686

(43)Date of publication of application : 13.06.2000

(51)Int.Cl. A61K 35/84
A23K 1/16
A23L 1/28
A23L 1/30
A23L 2/52
A23L 2/38
A61K 9/08
A61P 35/00
A61P 37/04
A61P 43/00

(21)Application number : 10-353928

(22)Date of filing : 27.11.1998

(71)Applicant : KOBAYASHI PHARMACEUT CO LTD
NAGAOKA HITOSHI

(72)Inventor : ASANO KENJI
MATSUDA YUKIKO
TAJIMA YUTAKA

(54) PREPARATION FOR LAK ACTIVITY POTENTIATION ARISING FROM EXTRACT FROM MYCELIA OF LNTINUS EDODES

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a preparation for LAK activity potentiation which is useful as an antitumor agent or anticancer agent, particularly an immunotherapeutic agent for direct administration utilizing no LAK(lymphokine activated killer) therapy, shows no adverse drug reactions and is inexpensive by including an extract from mycelia of Lentinus edodes.

SOLUTION: The preparation for LAK activity potentiation is obtained by including an extract from mycelia of Lentinus edodes. The above extract may be obtained by initially multiplying Lentinus edodes fungi on a solid culture medium containing strained lees of Saccharum officinarum L. and nonfat rice bran as base materials, loosening the solid culture medium containing the resultant mycelia followed by crushing it to pieces at 30-35°C in the presence of water and an enzyme selected from cellulase, protease or glucosidase to decompose, then heating at 95°C or lower to not only deactivate the enzyme but also sterilize and finally filtrating the resultant suspension. The objective preparation is preferably administrated by oral route. It is favorable that the preparation is administrated three times a day at a dose of

1000-1500 mg as the powder of the extract from mycelia of Lentinus edodes. The preparation can also be used in the form of foods.

LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

* NOTICES *

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the field of tumor immunology. If specified, this invention relates to the immunotherapy agent which has antitumor activity and/or anticancer activity. If furthermore specified, this invention relates to immunotherapy pharmaceutical preparation useful to activity enhancement of a LAK cell (Lymphokine Activated Killer Cell: lymphokine activation killer cell).
[0002]
[Description of the Prior Art] I hear that a tumor cell has a tumor antigen, and the underlying concept in tumor immunology has it. That is, existence of the tumor associated antigen (TAA:Tumor Associated Antigen) with which the manifestation is reinforced by an antigen (TSA:Tumor Specific Antigen) unique to a tumor cell or the normal cell with canceration of a cell although minute amount existence is recognized very much is known. Such a tumor antigen is discovered by change of the gene itself produced with the variation of a self cell, or its manifestation. As a cure for a tumor cell with antigenic [unusual], immunotherapy is the most common, immunity is carried out with a tumor antigen, or the drugs which reinforce an immunity function are used. Generally, rather than the normal cell, the NK (natural killer) cell is higher, and, as for the activity which destroys a tumor cell, it is known that the activity of a spontaneous killer cell will also be reinforced by immunotherapy. Although a spontaneous killer cell is a cell damage nature lymphoid cell which exists also in a normal individual and it was known that failure activity is shown without being restrained by the MHC antigen to a tumor cell, a virus infection cell, etc., existence of the tumor cell which cannot kill and wound a spontaneous killer cell, either also became clear.
[0003] S.Rosenberg of U.S. NCI discovered that the killer cell which kills and wounds the tumor cell which cannot kill and wound a spontaneous killer cell, either and which shows cell damage nature to the tumor cell of the large range was guided, when the lymphocyte was cultivated with interleukin 2 (IL-2) (refer to JP,62-116518,A). This killer cell was named the LAK cell (Lymphokine Activated KillerCell: lymphokine activation killer cell). As for the LAK cell, it is known that it is not an ensemble with a uniform cytology top but the cell population of a spontaneous killer cell system or a killer T cell system. In recent years, the adoptive immunity which used the LAK cell is tried (LAK therapy), and contraction of terminal cancer or the example of growth control is reported by repeat administration of a LAK cell. However, there is a critical side effect by the corporal burden and the IL-2 high-concentration administration to a lot of leucocyte separation in a LAK therapy, and the economic burden about mass culture is also large. The LAK adoptive immunity therapy using IL-2 specifically has a side effect stronger than the case where IL-2 are used independently, and symptoms, such as whole body fatigue, a chill, generation of heat, low albumin, ischemia, and eosinophilic leukocytosis, are from **. further -- it should observe -- it is that possibility that the trauma activity over the normal cell of a LAK cell is participating in the manifestation of some serious side effects is high, and the in vitro trauma over the lymphocyte besides ischemia or a platelet phenomenon, macrophage, and vascular endothelial cell by

the hematopoietic stem cell trauma is also reported.
[0004] Then, development of the drugs which do so the same effectiveness as a LAK therapy is desired, without being based on a LAK therapy.
[0005] If the anticancer agent generally makes fecundity with an unusual cancer cell the target and it is classified according to the candidate for inhibition, as a nucleic-acid-biosynthesis inhibitor, it has an alkylating agent, a nucleic-acid-biosynthesis substrate analog, an antibiotic, steroid hormone, etc., and has plant alkaloid etc. as mitotic poison. However, these anticancer agents show a remarkable side effect to coincidence to the bone marrow which is the normal cell of fecundity, a gastrointestinal tract epithelium, and a hair follicle. That is, the bone marrow control which causes the fall of the ulcer of nausea, vomiting, the oral cavity, and a small intestine, diarrhea, depilation, and active principle production of blood as a general symptom is caused irrespective of an administration gestalt. Then, it gropes for the anticancer active substance contained in safe bacteria or food etc. with which it turns out that it has an anticancer operation for many years as matter which replaces these anticancer agents. For example, the attempt which is going to gain control of cancer with bacteria has already been begun since the 1900s. The Coley's toxin using the culture filtrate of serratia marcescens and hemolytic streptococcus (1964), the leukemia therapy (Mathe and G. --) by BCG Adv.Cancer Res., 14, 1, 1971, and the regression (Zbar, B., et al., J.Natl.Cancer Inst., 48, 831, 1971) of the carcinoma phyma in a guinea pig, And the effectiveness over the transplantation tumor of the sarcoma 180 grade by administration of yeast wall polysaccharide etc. is reported.
[0006] Especially, the great effort has been directed towards pursuit of the anticancer effectiveness in the polysaccharide of yeast glucan, a yeast mannan, the polysaccharide of other fungus bodies, a lichen, and Basidiomycetes about polysaccharide. However, that current marketing is carried out as anticancer immunostimulant among these has Schizophyllum commune Fries polysaccharide etc. in the Krestin (the Kureha chemistry, Sankyo Pharmaceuticals: a host's immunity functional activator) of the KAWARATAKE culture mycelium origin of Polyporaceae of Basidiomycetes, and the lentinan list of shiitake mushroom polysaccharide.
[0007] It is the edible mushroom with which shiitake mushroom (Lentinus edodes) represents China in a Japanese list, and although artificial cultivation has been performed from before about 300 years in Japan, it is especially recently that a drug effect component began to be solved by the pharmacology effectiveness list very much. for example, the growth depressor effect (Sugano, N, et al., Cancer Letter, 27: 1, 1985; Suzuki **** et al. --) of transplantation tumor cells, such as the large intestine in a rat mouse, and liver A Japanese large intestine anus disease meeting magazine, 43:178, 1990, and the mitogen effectiveness (it Immunopharmacolog(ies) Tabata, T.et al., Immunopharmacology, 24: 57, 1992;Hibino, and et al. --) 28 : 77, 1994, etc. are reported.
[0008]
[Problem(s) to be Solved by the Invention] this invention persons paid their attention to the antitumor activity and/or anticancer activity which shiitake mushroom has that there is no side effect and a cheaply available antitumor agent or a cheaply available anticancer agent, especially the immunotherapy agent for direct administration which does not use a LAK therapy should be offered.
[0009]
[Means for Solving the Problem] By finding out that antitumor activity and/or anticancer activity are in the immunity activation activity list which easily endures a fruit body, and moreover taking the extract concerned directly in the component extracted from the hypha which is a gestalt in front of the fruit body which is the edible gestalt of shiitake mushroom, this invention persons find out doing so the effectiveness as drugs for an antitumor agent and/or an anticancer agent, especially LAK activity enhancement, and came to complete this invention.
[0010] That is, this invention relates to the pharmaceutical preparation for the antitumor agent containing the mycelium extract of shiitake mushroom and/or an anticancer agent, especially LAK activity enhancement.
[0011] The pharmaceutical preparation of this invention contains in the mycelium extract list of shiitake mushroom the support in which acceptance to arbitration on pharmaceutical sciences is possible.

[0012] It may mix with other drugs which have antitumor activity and/or anticancer activity in an immunity activation activity list, and the pharmaceutical preparation of this invention may be used together in it.
[0013] The pharmaceutical preparation of this invention may be food. The pharmaceutical preparation of this invention may be a drink.
[0014] Furthermore, the pharmaceutical preparation of this invention is not limited to these at all.
[0015]
[Embodiment of the Invention] The shiitake mushroom fungus body extract for the immunotherapy agents for direct administration by this invention means the extract obtained by grinding the mycelium which cultivates a shiitake mushroom bacillus on a solid medium, and is obtained, and the solid medium which contains a mycelium preferably under existence of water and an enzyme, and decomposing.
[0016] Although what was obtained by the following desirable approaches is used for a shiitake mushroom mycelium extract, it is not limited to this. Namely, a shiitake mushroom bacillus is inoculated on the solid medium which uses bagasse (sugarcane concentration is crimp ******) and defatted rice bran as a base material. Next, branch untying of the solid medium containing the mycelium which is made to increase a mycelium and is obtained is carried out so that a 12-mesh passing material may become 30 or less % of the weight. While adding to said solid medium, maintaining at the temperature of 30 to 35 degree C one sort of enzymes chosen from water and a cellulase, a protease, or glucosidase as this solid medium by which branch untying was carried out, or more than it Even if few, 70 % of the weight or more is a 12-mesh passing material, and it makes. said solid medium -- the bottom of existence of said enzyme -- grinding -- mashing -- bagasse fiber -- Next, it sterilizes, while carrying out deactivation of the enzyme by heating to the temperature to 95 degrees C, and a shiitake mushroom mycelium extract is obtained by filtering the obtained letter liquid of suspension. Although a shiitake mushroom mycelium extract may be used for the immunotherapy agent of this invention as it is, it is convenient to condense this, to freeze-dry, to save as powder, and to use it with various gestalten at the time of use. The powder obtained by freeze-drying is brown powder, is hygroscopic and has the unique taste and a unique smell.
[0017] thus, Folon-Denis to which protein is made 19.7% (weight/weight), and the shiitake mushroom mycelium extract obtained makes a gallic acid a standard by protein analysis according sugar to 25.3% (weight/weight) and a Lowry method by the sugar analysis by the phenol-sulfuric acid method -- polyphenol was included 2.6% (weight/weight) by law. In addition to this, fusibility non-nitrogen objects other than 8% of crude fat, 22% of crude ash, and sugar were included in the shiitake mushroom mycelium extract about 20%.
[0018] Moreover, the configuration sugar composition (5) of a shiitake mushroom mycelium extract was as follows.
Xyl: 15.2;Ara:8.2;Man:8.4;Gul:39.4;Gal:5.4;GlcN:12.0GLuUA:11.3.
[0019] The pharmaceutical preparation containing the shiitake mushroom mycelium extract of this invention offers the effectiveness which is equal to a LAK therapy by replacing with a LAK therapy and taking directly for a Homo sapiens patient's tumor immunity activity enhancement. Generally, a LAK therapy carries out tissue culture of the lymphocyte obtained from the cancer patient with IL-2, guides a LAK cell, and is large. [of the economic burden concerning / although it consists of a process returned to a patient's inside of the body, even if the drugs which replace IL-2 with a strong side effect temporarily are discovered, a LAK therapy has a corporal burden to a lot of leucocyte separation, and / mass culture] Furthermore, the danger of contamination also exists not a little after separating blood from a patient until it returns.
[0020] The pharmaceutical preparation containing the shiitake mushroom mycelium extract of this invention is not especially limited, although administration by taking orally is the most desirable. That is, as an object for internal use, although a tablet, a capsule, powder, a granule, a solution agent, syrups, etc. are illustrated, it is not limited to these.
[0021] Although a well-known excipient, a binder, disintegrator, lubricant, an aromatizing agent, a coloring agent, a solubilizing agent, suspension, a coating agent, etc. are included in the pharmaceutical

preparation containing the shiitake mushroom mycelium extract of this invention in this industry as support permissible on pharmaceutical sciences mixable to arbitration, it is not limited to these.
[0022] The dose of the pharmaceutical preparation containing the shiitake mushroom mycelium extract of this invention is determined by the medical practitioner in consideration of a patient's age, weight, a symptom, etc. Although it is not necessary to restrict a dose severely since the shiitake mushroom mycelium extract contained in the pharmaceutical preparation of this invention has been used as food for many years and it is very safe, it usually converts into shiitake mushroom mycelium extract powder. 100mg - 10000mg is divided once into a ter die still more preferably in about 2 - 3 steps per day, 500mg - 5000mg is divided once into a ter die especially preferably, and it is 1000mg - 1500mg per time. Furthermore, it is convenient, even if it uses together with other antitumor agents and/or an anticancer agent and prescribes a medicine for the patient.
[0023] The shiitake mushroom mycelium extract content pharmaceutical preparation of this invention can also be offered in the form of food. As a gestalt of desirable food, the shape of the shape of powder, granulation, and a paste and jelly etc. is mentioned. In making it granulation etc. furthermore, in order to add sweet taste, it is desirable to add saccharides, such as a lactose. Moreover, the shiitake mushroom mycelium extract content pharmaceutical preparation of this invention can also be offered in the form of a drink. Deodorization components, such as mineral constituents, such as a vitamin compound and calcium, alcohols, and polyphenol, etc. may be added to such food or a drink other than a shiitake mushroom mycelium extract. This food or drink may exist under the category of a food for specified health use, the food for illness persons, etc.
[0024] The shiitake mushroom mycelium extract content pharmaceutical preparation of this invention can also be offered in the form of the additive to feed as feed. By using the shiitake mushroom mycelium extract content pharmaceutical preparation of this invention as an additive to feed as feed of livestock, the neoplasm and/or cancer which are generated for livestock can be treated prevented, or the bacteria or the viral infectious disease over livestock can be treated or prevented. Consequently, the amount of the remedy used used about livestock now, for example, an antibiotic etc., can be decreased, and breeding cost can be fallen in connection with it. Furthermore, since the antibiotic was prescribed for the patient, there is further effectiveness that the period which cannot ship a product can be shortened more.
[0025] Although the LAK activity enhancement by the shiitake mushroom mycelium extract content pharmaceutical preparation of this invention can be checked according to the following process according to the approach of trees (249 clinical immunity, 19:245- 1987), it is not limited to this. After collecting blood peripheral blood from a LAK activity trial test subject and making one bundle (600mg) of powder of the shiitake mushroom mycelium extract content pharmaceutical preparation of this invention take for one week 6 times per day, peripheral blood is again collected blood from a test subject.
[0026] Heparin is added to each peripheral blood of recipe before and the back, and the monocyte of an interface is separated with the specific gravity centrifuge method using Ficoll-Conary liquid (s. g.=1.077). After PBS (pH7.4, calcium, and Mg are not included) washes the separated monocyte 2 to 3 times, it suspends in RPMI1640 culture medium (Gibco) which added FBS (inactivated serum) 10% so that it might be set to 1x106-/ml.
[0027] the subculture cell which is a target cell -- the harvest of Daudi or the Raji is preferably carried out according to centrifugal separation, and 100-150microcurie sodium chromate Cr51 is added. In 37 degrees C, it cultivates for 1 hour in CO2 incubator 5%. A cultured cell is suspended in FBS addition RPMI 1640 culture medium 10% so that it may be set to 1x106-/ml after 3 times washing by PBS.
[0028] the above-mentioned micro test plate -- each -- about a well, 1N-HCl is poured distributively to maximal solution debunching, and FBS addition RPMI 1640 culture medium is poured distributively 10% in a natural dissociation group (contrast), and an effector cell (every [200microl (4x104/well)]) is poured distributively in an experiment dissociation group. In 800rpm, at-long-intervals alignment separation is carried out for 5 minutes with a plate centrifugal separator, and it cultivates in 37 degrees C for 3.5 hours in CO2 incubator 5%.

[0029] the cultivated plate to SOKEN-PET sigma -96 -- each -- the culture supernatant of a well is extracted and radioactivity is measured with gamma-scintillation counter.
[0030] The degree of activation of a LAK cell can evaluate against an index the LAK activity computed according to the following tables.
[0031]

$$\text{LAK活性\%} = \frac{\text{実験解離（cpm）－自然解離（cpm）}}{\text{最大解離（cpm）－自然解離（cpm）}} \times 100$$

[0032] Although the following examples explain this invention to a detail further, these are instantiation to the last and are not for limiting the range of this invention. It is understood by this contractor that various modification or the qualification to this invention may be made, without deviating from the pneuma of this invention.
[0033]
[Example] Example 1: After including pure water in the solid medium which consists of the preparation bagasse 90 weight section of a shiitake mushroom mycelium extract, and the rice bran 10 weight section moderately, the shiitake mushroom seed fungus was inoculated, it was left in the culture interior of a room which adjusted temperature and humidity, and the mycelium was proliferated. After the mycelium crowded in the solid medium, branch untying of the fibrin of a bagasse base material is carried out, and it was made for a 12-mesh passing material to become 24 or less % of the weight. 40 degrees C of solid media were looked like [1.0kg of this culture medium by which branch untying was carried out] for 3.5l. of pure water, and purification sill RAZE 2.0g -- in addition, it considered as culture-medium content mixture, having.
[0034] Subsequently, grinding and a **** operation were made for a 200-minute about room, in addition about 80% of the weight of bagasse fiber to serve as a 12-mesh passing material in a gear part at a solid medium, circulating culture-medium content mixture with a gear pump with gear change. Grinding and **** of culture-medium content mixture were carried out raising the temperature of this mixture gradually. Then, it sterilized, while heating culture-medium content mixture to 90 more degrees C and making the enzyme deactivate, and it was left for 30 minutes at 90 degrees C. The obtained culture-medium content mixed liquor was filtered through the 60-mesh filter cloth, and it considered as the shiitake mushroom mycelium extract, and after condensing, freeze-drying powder was obtained.
Example 2: Peripheral blood was collected blood from the measurement test subjects A, B, C, and D of LAK activity.
[0035] Test subjects A, B, and C and D of each were medicated with 1200mg of shiitake mushroom mycelium extracts for one week 3 times every day.
[0036] Heparin was added to the peripheral blood which collected blood from test subjects A, B, C, and D, and the monocyte of an interface was separated with the specific gravity centrifuge method using Ficoll-Conary liquid (s. g.=1.077). After PBS (pH7.4, calcium, and Mg are not included) washed the separated monocyte twice, it suspended in RPMI 1640 culture medium (Gibco) which added FBS (inactivated serum) 10% so that it might be set to 1x106-/ml.
[0037] The harvest of the subculture cell (Daudi) which is a target cell was carried out according to centrifugal separation, and 100-150microcurie sodium chromate Cr51 (New England Nuclear) was added. In 37 degrees C, it cultivated for 1 hour in CO2 incubator 5%. The cultured cell was suspended in FBS addition RPMI 1640 culture medium 10% so that it might be set to 1x106-/ml after 3 times washing by PBS.
[0038] the above-mentioned micro test plate -- each -- about the well, 1N-HCl was poured distributively to maximal solution debunching, and FBS addition RPMI 1640 culture medium was poured distributively 10% in the natural dissociation group (contrast), and the effector cell (every [50microl (1x104/well)]) was poured distributively in the experiment dissociation group. In 800rpm, at-long-intervals alignment separation was carried out for 5 minutes with the plate centrifugal separator, and it

cultivated in 37 degrees C for 3.5 hours in CO2 incubator 5%.
[0039] the cultivated plate to SOKEN-PET sigma -96 -- each -- the culture supernatant of a well was extracted and radioactivity was measured with gamma-scintillation counter.
[0040] LAK activity was computed according to the following tables.

$$\text{LAK活性\%} = \frac{\text{実験解離（cpm）－自然解離（cpm）}}{\text{最大解離（cpm）－自然解離（cpm）}} \times 100$$

[0041] A result is shown in table 1 list at drawing 1 .
[0042]
[Table 1]
LAK activity Test subject A Test subject B Test subject C Before extract content pharmaceutical preparation recipe of test subject D this invention 13% 27% 14% After extract content pharmaceutical preparation recipe of 18% this invention 40% 43% 18% 28% [0043] In order to inspect the side effect by recipe of the shiitake mushroom mycelium extract of this invention, the biochemical examination of blood was carried out to test subjects A, B, and C. The result is shown in Table 2.
[0044]
[Table 2]

	被験者A		被験者B		被験者C	
	服用前	1週間服用後	服用前	1週間服用後	服用前	1週間服用後
WBC(×10³/μℓ)	5.45	5.94	5.85	5.08	8.01	7.47
RBC(×10⁴/μℓ)	4.56	4.61	4.99	4.85	4.89	4.85
Hb (g/dℓ)	14.2	14.2	14.4	13.8	15.5	14.8
Ht (%)	42.2	42.8	43.6	42.1	44.8	42.9
MCV(fℓ)	92.5	92.8	87.4	86.8	91.6	92.3
MCH(pg)	31.1	30.8	28.9	28.5	31.7	31.8
MCHC(g/dℓ)	33.6	33.2	33.0	32.8	34.6	34.5
PLT(×10⁴/μℓ)	19.1	18.5	23.9	19.3	29.2	29.7
RDW-SD(fℓ)	43.7	44.6	43.5	43.6	43.7	44.8
RDW-CV(%)	12.8	13.0	13.4	13.6	13.0	13.3
PDW(fℓ)	14.0	13.4	11.6	12.8	13.3	13.2
MPV(fℓ)	11.1	10.9	10.0	10.2	10.6	10.4
P-LCR(%)	34.1	32.5	24.9	27.6	30.1	28.8
Stab	0.5	0.5	1.0	0.0	0.5	0.0
Seg	54.0	48.5	56.0	43.5	48.5	38.5
Lym	37.5	40.5	38.0	45.5	28.5	35.0
Mono	4.5	7.5	3.0	9.5	11.5	8.5
Eo	2.5	3.0	1.5	1.0	12.0	15.5
Baso	1.0	0.0	0.5	0.5	0.5	0.5
TP(g/dℓ)	6.6	6.9	7.7	7.5	8.0	7.7
ALB(g/dℓ)	3.9	4.1	4.4	4.3	4.8	4.7
A/G	1.44	1.48	1.33	1.34	1.50	1.57
TTT(SHU)	3.9	5.0	8.0	8.1	5.3	3.0
ZTT(Kunk)	8.6	8.4	12.6	12.4	6.3	4.9
U-N(mg/dℓ)	10.4	10.3	10.2	11.2	11.8	11.6
U-A(mg/dℓ)	5.6	5.9	5.4	5.2	6.1	5.9
クレアチニン(mg/dℓ)	0.67	0.71	0.84	0.82	0.67	0.72
総BIL(mg/dℓ)	0.6	0.7	0.5	0.6	0.5	0.5
直接BIL(mg/dℓ)	0.1	0.1	0.0	0.0	0.1	0.1
間接BIL(mg/dℓ)	0.5	0.6	0.5	0.6	0.4	0.4
GLU(mg/dℓ)	124	104	94	111	115	114
AST(GOT)(IU/ℓ)	15	13	18	16	33	33
ALT(GPT)(IU/ℓ)	29	30	20	20	45	57
LD(LDH)(IU/ℓ)	142	139	171	152	380	343
CK(CPK)(IU/ℓ)	121	131	227	177	317	224
ALP(IU/ℓ)	131	136	156	148	174	162
γ-GT(IU/ℓ)	12	14	23	23	225	240
LAP(IU/ℓ)	45	40	80	73	134	120
CHE(IU/ℓ)	2358	2593	2779	2749	3191	3299
AMY(IU/ℓ)	78	87	107	93	59	54
T-CHO(mg/dℓ)	208	232	208	200	255	243
HDLCHO(mg/dℓ)	50	50	44	40	47	47
T-G(mg/dℓ)	135	210	270	303	451	359
Na(mEq/ℓ)	141	142	140	141	139	141
K(mEq/ℓ)	3.7	3.9	4.1	3.8	4.0	4.2
Cℓ(mEq/ℓ)	106	107	105	107	103	104
Ca(mEq/ℓ)	4.4	4.4	4.6	4.4	4.9	4.7
I-P(mg/dℓ)	3.3	3.1	3.0	2.7	3.5	3.2
H	0	0	0	0	1	0
L	0	0	0	1	1	0
I	0	1	1	1	1	1
RAテスト	(-)	(-)	(-)	(-)	(-)	(-)
CRP(mg/dℓ)	0.03	0.06	0.02	0.01	0.07	0.12
ANA	≤40	≤40	≤40	≤40	≤40	≤40
ANAパターン	(-)	(-)	(-)	(-)	(-)	(-)
CH50(CH50/mℓ)	33.0	33.0	45.0	42.0	53.0	52.0

[0045]
[Effect of the Invention] The shiitake mushroom mycelium extract content pharmaceutical preparation of this invention showed the remarkable rise of LAK activity for all in test subjects A, B, C, and D. From the result of the biochemical examination of blood which inspects the side effect by recipe of the shiitake mushroom mycelium extract of this invention and which went to accumulate, it can be said that a side effect does not exist.
[0046] The pharmaceutical preparation containing the shiitake mushroom mycelium extract of this invention can raise LAK activity by internal use, without enforcing a LAK therapy. That is, LAK activity can be reinforced, without being accompanied by the pain by blood collecting, and the danger of contamination.
[0047]

[Translation done.]

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CLAIMS

[Claim(s)]
[Claim 1] Pharmaceutical preparation for LAK activity enhancement containing a shiitake mushroom mycelium extract.
[Claim 2] Physic or pharmaceutical preparation for LAK activity enhancement of veterinarian medical use containing a shiitake mushroom mycelium extract and the support in which acceptance on pharmaceutical sciences is possible.
[Claim 3] Pharmaceutical preparation according to claim 1 or 2 which is an object for internal use.
[Claim 4] Pharmaceutical preparation according to claim 1 which is food.
[Claim 5] Pharmaceutical preparation according to claim 1 which is a drink.
[Claim 6] Pharmaceutical preparation according to claim 1 which is feed.
[Claim 7] Pharmaceutical preparation according to claim 1 or 2 which is injection or an object for dermal administration.
[Claim 8] Pharmaceutical preparation of claim 1 thru/or the any 1 term publication of seven used for the therapy of a neoplasm and/or cancer.

[Translation done.]